Case Study Development and Use

Most case studies should be a record of what happened under certain stated conditions when conservation treatments were applied. A case study need not be approached as a complex research effort requiring explicit hypotheses, research design, and statistical tests of significance, but each of these concepts could be considered and used.

Planners should begin by thinking about the resource base in their area (county resource and landuse situations). Ask **"What resource settings are dominant in this county and what are the main associated problems and opportunities?"**

Answering this question will help you develop a strategic view of the area and will direct case study efforts to situations where the needs and opportunities are greatest. Some basic county level resource and landuse data will facilitate the initial part of the case study development process.

Once the dominant crop/livestock and resource settings for your county are identified, predominant treatments can be identified and aligned with the landuse situations. Then priorities can be established for developing case studies. It is anticipated that most field offices have 5 to 7 dominant crop/livestock and resource situations and perhaps a comparable number of dominant treatment systems.

The **key to success** with case studies is to select resource situations with a broad applicability to many landusers, i.e., the studies should be developed for major resource concerns on soil mapping units and in resource use situations that represent a significant portion of the resource users in your county.

This data and your understanding of the resource conditions, conflicts in use, current trends, and expected future changes, can be viewed along with knowledge of the socio-economic groups in your area to select case study subjects and farmer candidates.

Selecting the Farmer

A cooperative, knowledgeable farmer is one of the most important elements for a successful case study.[1] If the cooperating farmer can be classified as an "early adopter" rather than a "late majority" or "laggard", you will have an easier job of convincing other farmers to accept the results (see Exhibit 3 "A Composite Picture of Adopter Categories" for added information). For new and untested technology, an innovator is probably the best prospect for a case study.

What information needs to be collected?

A case study can be conducted as part of your ongoing conservation planning work with little extra time needed during your review of the farm operation and while developing and evaluating alternatives (planning elements 4, 5 and 6).

Additionally, follow-up (element 10) needed after the conservation plan has been implemented (element 9), will serve to verify or reject planning expectations and the results that the decision maker hoped to achieve.

1 Studies show that a farmer's most respected source of information about new crops, practices, and technologies is other farmers. If you can cite results obtained on the farm of a respected local resident, you will have satisfied one of the key concerns of most farmers.

Therefore, planning notes from an existing conservation plan might contain all or most of the information needed to produce a good case study. However, for best utility, you will need to **structure the information in your case study to include data on the kinds, amounts, and timing of actions taken to implement conservation treatments.**

Typically, a case study will attempt to measure quantifiably the level of inputs and outputs associated with a particular conservation practice or system (see Exhibits 1 and 2). You should record farming operations undertaken, type of equipment used, dates of operations, number of operations to complete work, and the kinds and amounts of inputs such as seed, fertilizer, pesticides, tractor hours, fuel consumption and labor required.

To the extent that treatment significantly affects yields, erosion rates, and other observable indicators related to the resources of concern (soil, water, air, plants, and animals)--such data should also be recorded. Any significant changes in operational and managerial conditions and decisions should also be noted.

The degree of detail and selection of input and output factors to collect data for, should be guided by common sense and professional judgement. For example, the conservationist can ask himself the question: "What should I observe in order to gauge results and judge 'success' ?" Such efforts will help prioritize system variables and streamline data collection and analysis.

Alternative types of case studies

Case studies can be based on:

(1) a comparison of the "before and after treatment" conditions on a single farm;

(2) a comparison of two separate, but comparable resource and landuse situations on different farms or even on the same farm, i.e., one site "with and one without treatment"; or

(3) a simple recording of the results a farmer experiences "with treatment" on a single site regardless of the "before" treatment conditions.

The first and second alternatives mentioned above require that data be collected for both the "before treatment" or benchmark situation (without treatment) and the "after treatment" (with treatment) condition arising from the conservation option adopted.

The last alternative represents the simplest, easiest approach, but inherently has the greatest risk for misunderstanding cause and effect relationships because it focuses on "with treatment" conditions only. Interpreting specific changes attributable to conservation treatments with this method is not as valid as the other two approaches.

This may not matter, for the immediate future, if the optional situation is deemed more desirable than the new cooperator's present situation and the adoption of conservation technology is accompanied by the other innovations that were part of the case study example. However, a more precise understanding of the cause and effect relationships due to conservation is important for our work over the longer term. Indeed, conservation effects and impacts information incorporated into Section V over time should result in improvements to Section III.

Conservation Effects vs. Impacts

The difference between "before and after treatment" or "with vs. without treatment" input/output conditions represents change. This change may be all or in part due to the conservation treatment.

Change attributable to NRCS/District-recommended treatment is defined as the conservation impact.

Effects represent the quantitative and qualitative descriptive characteristics of the outcomes of treatment only. They are the overall results which provide a general vision of the treatment and its effectiveness. The effects show what a practice or system looks like, its characteristics and results, and represent the general expectations achievable elsewhere if the resource conditions are relatively similar.

The effects of a conservation option can be relied upon by the planner for depicting the expected response to treatment for a given conservation option and resource situation. The effects information developed with approaches 1 and 2 will influence a new cooperator's expectations for change and can be used to focus new planning efforts in order to avoid unrealistic expectations based on a new cooperator's impressions of the case study estimated impacts (change).

The specific changes (impacts) realized in a case study can aid decision making, but are not always needed. Assuming that the new cooperator's resource and enterprise situation is comparable to the case study, then a general idea of the kinds of conditions (effects) to be created should meet his or her minimum information needs. Thus Alternative 3 is acceptable, but will not provide the new cooperator with a detailed understanding of the pre-treatment case study conditions nor an estimate of the changes realized as would the first two methods.

This point is very important because the exact change or impacts achievable will vary somewhat for every farmer who applies a particular conservation option and the case study approach that you select to share with a new cooperator will be showing one of several possible comparisons:

- between the new cooperator's current condition and the case study "before and after treatment conditions" (alternative approach #1);
- between the new cooperator's current condition and the case study "with and without treatment conditions" (alternative approach #2); or
- between the new cooperator's current condition and the case study "with or after treatment conditions" (alternative approach #3).

An understanding of these analysis concepts and case study approaches is essential to avoid confusion. Apart from time requirements, the approach used does not matter as long as the expected outcomes or effects are not unique and they should not be in similar resource settings, i.e., once again, the before treatment conditions and after treatment results should be representative and therefore replicable.

The main advantage of the first two methods for conducting a case study is the identification of conservation impacts (change). They also offer another advantage over the third approach. Data from "before and after" or "with and without" treatment case studies helps to assure that all important issues and planning steps have been followed. The conservation effects and associated impacts provide an abundance of information for new clients to begin evaluating the appropriateness of the case study to their specific situation and then build their own conservation plans.

In summary, the results of any case study must be described within a context which identifies the resource situation and the actions and timing of those actions taken to achieve expected treatment outcomes.

Several methods for organization and development may be used and a minimum of data requirements must be met to help other farmers understand the consequences of their choice.

The data collected in a case study at a minimum must:

1. be specific for a conservation practice or system;
2. attempt to hold all variables not related to the conservation treatment constant (this requires careful farmer selection and consultation during implementation to avoid changes in varieties, fertilizer, etc.)
3. include the kinds, amounts and timing of treatment actions; and
4. identify the physical and biological effects associated with those actions.